

# **Diagnostic for Alzheimer's disease based on immune cell signature**

Stanford researchers have developed a molecular diagnostic for Alzheimer's disease (AD) based on their recent discovery of an immunologic signature. While innate inflammation has been implicated in AD, little is known about the role of the adaptive immune response. The researchers discovered that the presence of certain adaptive immune cells, called CD8+ T effector memory CD45RA+ (TEMRA) cells in the brain is associated with AD. These cells 'patrol' the brain and cerebrospinal fluid of people with AD, and may promote neuronal damage directly or indirectly. This exciting discovery could be developed alongside biomarkers of neuronal damage and degeneration, enabling blood-based diagnostic tests and early stage detection of this devastating disease.

## **Stage of Research**

Further validation and development is ongoing. The researchers have extended their finding to include: deeper molecular characterization of the immunologic signature in blood and cerebrospinal fluid, evidence of a negative relationship with cognition, and demonstration of these cells entering post-mortem AD brains.

## **Applications**

- Molecular diagnosis of Alzheimer's disease and potentially other neurodegenerative conditions

## **Advantages**

- First identification of a novel blood-CSF adaptive, active immune response in AD
- May allow earlier, definitive diagnosis of AD

- Minimally invasive

## Publications

- D. Gate, N. Saligrama, O. Leventhal, A.C. Yang, M.S. Unger, J. Middeldorp, K. Chen, B. Lehallier, D. Channappa, M.B. De Los Santos, A. McBride, J. Pluvina, F. Elahi, G. K-Y Tam, Y. Kim, M. Greicius, A.D. Wagner, L. Aigner, D.R. Galasko, M.M. Davis & T. Wyss-Coray. [Clonally expanded CD8T cells patrol the cerebrospinal fluid in Alzheimer's disease](#) *Nature* Jan. 8, 2020.

## Patents

- Published Application: [WO2020198299](#)

## Innovators

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